C7790

S/040/60/024/005/013/028
C111/C222

On the Injection of a Fluid or Gas Which Conducts Electricity Into the Boundary Layer in Presence of a Magnetic Field

tenacity), while k_* is the parameter of the magneto-gasodynamic inter-

action, $k = \dfrac{H_*^2 l \delta_2^0 \eta_2^0}{c^2 g_\infty u_\infty \eta_\infty \delta^n}$, where l is the length of the plate, H_1

is defined by $H^0 = H_* H(x)$ (H^0 is the normal component of the magnetic field at the wall). A numerical calculation shows that the presence of the magnetic field diminishes the surface friction. The total resistance of the plate for the injection is greater with a magnetic field, but not greater than the total resistance without an injection and without a magnetic field.

There are 2 figures and 2 Soviet references.

SUBMITTED: May 23, 1960

Card 4/4

VA...HIN, A.B. (Moskva)

Solution of some boundary value problems in magnetohydrodynamics. Prikl. mat. i mekh. 25 no.5:965 S-O '61.
(MIRA 14:10)

(Boundary value problems)
(Magnetohydrodynamics)

37138
S/179/62/000/001/006/027
E114/E181

26.1410

AUTHOR: Vatazhin, A.B.   (Moscow)

TITLE: Magnetohydrodynamic flow in a flat duct with
             finite electrodes

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhniches-
             kikh nauk. Mekhanika i mashinostroyeniye, no.1, 1962,
             52-58

TEXT: The article considers a case of a duct, the walls of
which are built up of series of electrodes separated by blocks
of insulating material with the magnetic field concentrated in
particular sections of the duct. This is a generalisation of an
analysis obtained by the author and others previously for
hydrodynamic flow of an ideal fluid with constant conductivity
in a flat duct of infinite length and with the vector of
magnetic flux perpendicular to the plane of flow. Of the
published studies of laws governing the current leakage in the
boundary zones of d.c. electromagnetic pumps, the determination
of boundary losses at the entry of the conducting zone into the
magnetic field, and discussions of flow in a duct when
Card 1/3

Magnetohydrodynamic flow in a flat ...   S/179/62/000/001/006/027
E114/E181

generating electric power, only in the previous article by the present author (Ref.4, PMM, v.25, no.5, 1961) was the finite length of electrodes taken into consideration. The magnetic field was at the time considered either uniform or concentrated only at the electrodes. The present article extends the equations obtained in the above-mentioned work, making them applicable for any distribution of the magnetic field along the axis of the duct. The starting point is a set of equations of motion of fluid with constant electrical conductivity in a flat duct of infinite length and constant width, with the walls of the duct (which are made of insulating material) containing symmetrically disposed electrodes connected to an external load. Boundary conditions corresponding to the presence of electrodes and insulating walls are introduced and the solution is obtained by utilising the formula of Keldish-Sedov. A particular solution is derived for the case of a symmetrical magnetic field, and is found to be dependent on the ratio of the length of the electrode to the width of the duct. The electrical parameters of the external load are considered. The general equation is solved

Card 2/3

Magnetohydrodynamic flow in a ...   S/179/62/000/001/006/027
                                     E114/E181

for the case when length of the electrodes is greater than the
width of the duct. By considering the limiting case of a
magnetic field, concentrated only at the electrodes and vanishing
at the insulated walls of the ducts, it was deduced that the
current in the external circuit tends to zero if point electrodes
are used. As the length of the electrodes tends to zero, finite
power can be absorbed by the external load only if the magnetic
flux becomes infinitely large. A solution is found for a case
when the magnetic induction outside the gap between the magnetic
poles very quickly diminishes to zero. A function is derived
allowing the convenient calculation of the current and power
dissipated in the external load.
There are 7 figures.

SUBMITTED: September 19, 1961

Card 3/3

38094
S/040/62/026/003/017/020
D407/D301

26.1410

AUTHORS: Vatazhin, A.B., and Regirer, S.A. (Moscow)

TITLE: Approximate calculation of current distribution in conducting-fluid flow in a channel in the presence of a magnetic field

PERIODICAL: Prikladnaya matematika i mekhanika, v. 26, no. 3, 1962, 548 - 556

TEXT: The problem of current distribution is considered in its general formulation. The conditions are stated which lead to simplified solution-schemes. First, the space-distribution of the current is considered. In various cases (e.g. the flow takes place under weak magnetohydrodynamic action, the electromagnetic forces are close to potential forces, etc.), the hydrodynamic quantities can be assumed as approximately known from the corresponding solutions of ordinary hydrodynamics (in the absence of a magnetic field); these quantities can be used for determining the current distribution. Assuming the hydrodynamic quantities as known, the stationary problem of current distribution is described by the system of equations

Card 1/4

Approximate calculation of current ...   S/040/62/026/003/017/020
D407/D301

$$f(j,\ \sigma,\ \nabla\psi,\ B,\ v,\ \dots) = 0 \qquad (1.1)$$

$$\text{rot } B = \frac{4\pi R}{c}\, j, \qquad \text{div } B = 0 \qquad (1.2)$$

$$\text{div } j = 0 \qquad (1.3)$$

where ψ is the electrostatic potential and B – the vector of magnetic induction. Eq. (1.1) represents Ohm's law. All the arguments of f, except B, j and $\nabla\psi$, are known. In contradistinction to so-called "kinematic" problems, in which an exact solution to system (1.1) –(1.3) is sought, the author considers its approximate solution on the basis of additional assumptions concerning the properties of the fluid, the geometry of flow, and the character of the magnetic field The case is considered, in which the interval magnetic field has a non-constant z-component which depends on x and y. The distribution of the currents and of the magnetic field is determined from Eq. (1.2) and from Ohm's law (1.1), which is written, in many cases which are of practical interest, (the Hall effect being taken into account), as

$$j = \sigma(-\nabla\psi + \frac{1}{c}\, v \times B) - \alpha j \cdot x\, B \quad (\alpha = \frac{\omega\tau}{B}) \qquad (2.2)$$

Card 2/4

Approximate calculation of current ...

The solution of system (1.2) (2.2) is greatly simplified in the case of small magnetic Reynolds-numbers R_m, when the magnetic field in the fluid differs little from the external field. In setting up the boundary conditions, it is assumed that the channel has infinite length. Further, fluid flow in the presence of an external three-dimensional magnetic-field is considered (the external magnetic field in the previous case had only a non-zero z-component). Ohm's law is written in the form

$$j = \sigma(-\nabla\varphi + \frac{1}{c}\, v \times B). \qquad (3.1)$$

At small Reynolds number R_m, one obtains

$$\triangle\varphi = \nabla \ln \sigma(-\nabla\varphi + \frac{1}{c}\, v \times B) + \frac{B}{c} \text{ rot } v; \qquad (3.3)$$

v and σ are given; thereupon the potential φ can be found from (3.3) and the current j from (3.1). Further, two-dimensional problems are considered. Rectilinear fluid-flow with small R_m is assumed. Thereby equations (3.1) (3.3) are simplified. The transition from three-

Card 3/4

Approximate calculation of current ...   S/040/62/026/003/017/020
                                           D407/D301

dimensional problems to two-dimensional ones can be effected by ave-
raging over the width of the channel. The case of fluid-flow with
anisotropic conductivity is also considered. It is noted that the
above problems lead to Poisson's equation or to a non-homogeneous
elliptic equation of a more general type; homogeneous equations are
obtained only in a few cases. This is not convenient for practical
problems. The most important English-language reference reads as
follows: H. Grad, Reducible Problems in magneto-fluid dynamic steady
flows. Rev. Mod. Phys., 1960, v. 32, no. 4, 830 - 847.

SUBMITTED: March 5, 1962

Card 4/4

VATAZHIN, A.B. (Moskva); REGIRER, S.A. (Moskva)

Approximate computation of current distribution in the flow of a con-
ducting fluid along a channel in a magnetic field. Prikl. mat. i
mekh. 26 no.3:548-556 My-Je '62.
(MIRA 16:5)
(Magnetohydrodynamics) (Electric currents)

VATAZHIN, A.B. (Moskva)

Joule dissipation in the channel of a magnetohydrodynamic
generator. PMTF no.5:59-69 S-O '62.   (MIRA 16:1)
        (Magnetohydrodynamics)   (Electric generators)

VATAZHIN, A.B.

AID Nr. 990-2   14 June

ELECTRICALLY CONDUCTIVE MEDIA MOVING ALONG A CHANNEL IN A MAGNETIC FIELD (USSR)

Vatazhin, A. B.   Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, Mar-Apr 1963, 39-54.   S/207/63/000/002/004/025

In order to determine the characteristics of magnetohydrodynamic devices, several problems concerning the distribution of current in channels with 1) dielectric walls and 2) electrodes of finite length have been solved. In both cases a Reynolds magnetic number much smaller than unity and an external axial magnetic field were assumed. In the first case. isotropic electric conductivity changing only in an axial direction was also assumed. The second case was solved both for anisotropic electric conductivity and for zero electric conductivity outside the electrode zone. Solutions for special cases in which electrodes are distributed symmetrically and skewed in relation to each other were also investigated.   [JA]

Card 1/1

AUTHOR: Vatazhin, A. B. (Moscow)

TITLE: On the breakaway of a magnetic hydrodynamic boundary
               layer

PERIODICAL: Prikladnaya matematika i mekhanika, v. 27, no. 2,
               1963, 338-341

TEXT: The author considers a two-dimensional boundary layer on
the surface of a body or the wall of a channel. The x-component is
measured along the wall and the y-component perpendicular to it.
It is supposed that the vector of the external magnetic field lies
in the xy plane. Then, in the usual notation, the breakaway point
will be given by u = 0, v = 0, $\partial u / \partial y = 0$. It is shown that in the
breakaway section

$$\xi^* = 2 \left[1 + \frac{\sigma B^2 \delta^2}{12 \eta c^2} + \frac{1}{360} \left(\frac{\sigma B^2 \delta^2}{\eta c^2} \right)^2 \right]^{-1} \quad \left(\xi = \frac{p' \delta^2}{\eta u_0} \right) \qquad (2.3)$$

Card 1/3

On the breakaway ...

where δ is the thickness of the boundary layer, $B = B(x)$ is the y-component of the magnetic induction and $p' = dp_0/dx$ and c is the velocity of light in vacuo. ξ^* is the value of ξ in the breakaway section. Application of the Karman integral relationship and integration gives

$$\frac{d}{dx}\frac{\delta^2}{2} = \frac{\delta^2}{2}\left(\frac{2\alpha_1\sigma^0 B^2}{c^2\alpha_2\rho^0 u_0} - \frac{2\alpha_3}{\alpha_2 u_0}\frac{du_0}{dx} - 2\frac{d\ln\alpha_2}{dx} + \frac{2p'}{\rho^0 u_0^2\alpha_2}\right) + \frac{\eta(p,1_{*0})}{\rho^0 u_0'\alpha_2}\left(\frac{\partial\varphi}{\partial z}\right)_{z=0}$$

$$\left(\alpha_1 = \int_0^1 \varphi N_2 dz, \quad \alpha_2 = \int_0^1 (\varphi - \varphi^2)N_1 dz, \quad \alpha_3 = \int_0^1 (\varphi - 2\varphi^2)N_1 dz\right)$$

$$(3.1)$$

Card 2/3

On the breakaway ...   S/040/63/027/002/010/019
                                                  D251/D308

where $\varphi = u/u_0$, i is the enthalpy and ρ^0 and σ^0 are constants. If φ is independent of δ (3.1) reduces to a first-order linear differential equation. The case of an incompressible fluid, with σ and η constant and the electric field different from zero, and in the case of Couette flow in a two-dimensional channel are considered in further detail. There is 1 figure.

SUBMITTED: December 20, 1962

Card 3/3

VATAZHIN, A.B. (Moskva)

Some two-dimensional problems concerning the current distribution
in a conducting medium moving along a channel in a magnetic field.
PMTF   no.2:39-54   Mr-Ap '63.   (MIRA 16:6)
                    (Magnetohydrodynamics)

VATAZHIN, A.B. ; NEMKOVA, N.G. (Moscow):

"Integral characteristics of the magneto-hydrodynamic generator with
non-conductive baffle plates".

report presented at the 2nd All-Union Congress on Theoretical and Applied
Mechanics, Moscow, 29 January - 5 February 1964.

ACCESSION NR: AP4034270   S/0207/64/000/002/0040/0049

AUTHORS: Vatazhin, A. B. (Moscow); Nemkova, N. G. (Moscow)

TITLE: Two dimensional problems on the distribution of electrical current in the channel of a magnetohydrodynamic generator with nonconductive barriers

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1964, 40-49

TOPIC TAGS: electric current distribution, magnetohydrodynamic generator, non-conductive barrier, eddy current, power loss, electrolytic bath, magnetic field intensity, homogeneous magnetic field

ABSTRACT: The authors study the problem of decreasing loss of effectiveness in a generator and loss of generated power by introducing nonconductive barriers in the channel of the generator to prevent spreading out of the current outside the electrode zone. G. W. Sutton has obtained analytic solutions for certain special cases of distribution of the barriers. Simulation of the channel of a generator in an electrolytic bath has been used by others to show that the introduction of barriers is unsuitable if the magnetic field is homogeneous over the entire length of the channel. The authors of the present work show that the problem of deter-

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ACCESSION NR: AP4034270

mining the characteristics of a generator with nonconductive barriers for the homogeneous magnetic field case (and for the case of a field concentrated only in the electrode zone) can be reduced to the following problem: to determine the current penetrating through the channel as a result of applying the differences of potentials to the electrodes when the velocity of the medium and the magnetic field intensity are equal to zero. The problem is simulated in an electrolytic bath. The authors study conditions under which the analytic solution of this problem for a channel with barriers can be constructed with the help of simple solutions of the problem for channels without barriers. Orig. art. has: 7 figures and 36 formulas.

ASSOCIATION: none

SUBMITTED: 07Jan64

SUB CODE: EE

DATE ACQ: 15May64

NO REF SOV: 008

ENCL: 00

OTHER: 002

Card 2/2

ACCESSION NR: AP4044729   S/0207/64/000/004/0122/0123

AUTHOR: Vatazhin, A. B. (Moscow)

TITLE: Determining joule dissipation in a channel with dielectric walls and a single nonconducting partition in conducting flow and a nonhomogeneous magnetic field

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 4, 1964, 122-123

TOPIC TAGS: magnetohydrodynamics, conformal mapping, MHD generator, Reynolds number, plasma heat flow

ABSTRACT: Joule heating in a one-dimensional, infinitely long magnetohydrodynamic channel with a single nonconducting partition was studied analytically. The partition is infinitely thin and extends in the region $0 < x < \infty$, $y = 0$. The external magnetic field has the form

$$B = (0, 0, -B)$$

$$B = \begin{cases} B_0 = \text{const} & \text{at } x < 0, \\ 0 & \text{at } x > 0, \end{cases}$$

The flow velocity V_0 is constant, and the magnetic Reynolds number is much less than unity. The upper half of the channel is transformed to the upper half-plane
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ACCESSION NR: AP4044729

by a conformal mapping using the transformation $t = \exp(\pi z / \delta)$ $(z = x + iy)$, where $f_1(z)$ is analytic in the domain $\text{Im} t > 0$ and is given by

$$f_1(z) = \frac{\partial \varphi}{\partial x} - i \frac{\partial \varphi}{\partial y} = u_1(z) + i v_1(z) \quad (z = x + iy) \quad .$$

The components of the current j_x and j_y are represented by

$$j_x = -\sigma \frac{\partial \varphi}{\partial x}, \quad j_y = -\sigma \frac{\partial \varphi}{\partial y} + \frac{\sigma}{c} V_0 B, \quad \Delta \varphi = 0 \quad .$$

A Cauchy type integral is obtained which eventually leads to a closed form expression for Joule heating given by $Q = \frac{16\sigma\delta^2}{c^2\pi^2} B_0 V_0 \tau$ where $\tau = 0.6$.

This shows that the presence of a partition reduces Joule dissipation by a factor of 1.76. Orig. art. has: 10 equations and 1 figure.

ASSOCIATION: none

SUBMITTED: 10Mar64

SUB CODE: ME,GP

NO REF SOV: 006

ENCL: 00

OTHER: 003

Card 2/2

L 5391-66 EWP(m)/EPA(w)-2/EWT(1)/T-2/EPA(sp)-2/EWA(m)-2   IJP(c)

ACC NR: AP5027267

AUTHOR: Vatazhin, A. B. (Moscow)

ORG: none

SOURCE CODE: UR/0207/65/000/005/0028/0033

61
58
B

TITLE: On heating of a medium due to Joule dissipation energy

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 5, 1965, 28-33

TOPIC TAGS: MHD, heat transfer, magnetohydrodynamic heating, temperature distribution, Laplace transformation, electric current

ABSTRACT: The effect of Joule heating is studied in a plane electromagnetic accelerator. The heat flow vector is represented by

$$q = -k\nabla T - bjT \qquad (b = const)$$

and the governing differential equations by

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L 5391-66

ACC NR: AP5027267 $\frac{\partial \vartheta}{\partial \tau} = \frac{\partial^2 \vartheta}{\partial y^2} + 2a \frac{\partial \vartheta}{\partial y} + v$, $\vartheta(0, y) = \vartheta_i$. at $0 < y < 2$ 3

$$\vartheta(\tau, 0) = 0, \quad \vartheta(\tau, 2) = 0$$

$$\left(\vartheta = \frac{T - T_w}{T_w}, \quad Y = hy, \quad t = \frac{h^2 \rho c_p \tau}{k}, \quad 2a = \frac{bjh}{k}, \quad v = \frac{wh^2}{kT_w} \right).$$

A closed form solution is obtained for a constant v and infinite time $T \to \infty$. For a more general solution the equations are Laplace transformed and integrated to yield hyperbolic functions which are then expanded in power series. For small times and small values of the parameter "a" the following expression is obtained for the heating rate

$$Q \approx \frac{4\vartheta_i \sqrt{\tau}}{\sqrt{\pi}} \left(1 + \frac{a^2 \tau}{3} \right) + \frac{8v \tau \sqrt{\tau}}{3 \sqrt{\pi}} \left(1 + \frac{a^2 \tau}{5} \right).$$

These and the more general results are shown graphically for several values of "a". The above results are then discussed in the light of friction forces and thermal conduction in a MHD channel. It is shown that when the heat flow vector has a term proportional to the electric current the heat transfer is intensified. Orig. art. has: 21 equations and 4 figures.

SUB CODE: TD, ME/   SUBM DATE: 28May65/   ORIG REF: 004/   OTH REF: 001

Card 2/2

ACCESSION NR: AP5013364

AUTHOR: Vatazhin, A. B. (Moscow)

TITLE: Development of the magnetohydrodynamic boundary layer due to the sudden
initiation of motion or sudden deceleration of a supersonic flow on the surface of a
half space

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1965, 3-14

TOPIC TAGS: magnetohydraodynamics, boundary layer, supersonic flow, viscous flow,
Prandtl number, Stanton number, Maxwell equation

ABSTRACT: The problem of the nonstationary flow of a viscous, compressible, conduct-
ing liquid over the surface of a half space is considered in this paper. Starting
from the standard boundary layer equations, Maxwell's equations, and the Ohm's law,
the various terms are ordered in the limit of small viscosity. The following
relations are obtained for the magnetic field

$$|H_z| \sim \frac{H^* R_m}{1 + \beta^{*2}}, \quad |H_1| \sim \frac{H^* R_m}{1 + \beta^{*2}} \beta^* \quad \left(R_m = \frac{u_\infty \delta}{\nu_m^*}, \quad \nu_m^* = \frac{c^2}{4\pi\sigma^*} \right),$$

Here $\beta = \frac{e\tau}{mc}$, τ is the average time between collisions, and the other symbols have
standard meanings. Nondimensionalizing all the equations with respect to the
Card 1/3

L 52159-65
ACCESSION NR: AP5013364

corresponding values at infinity, the following set of equations is obtained

$$\frac{\partial}{\partial t} + \frac{\partial \rho^o v}{\partial y} = 0, \quad \rho^o \frac{\partial u^o}{\partial t} + \rho^o v \frac{\partial u^o}{\partial y} = v_\infty \frac{\partial}{\partial y} \mu^o \frac{\partial u^o}{\partial y} - es\,(e_x - \beta e_z + u^o + \beta w^o)$$

$$\rho^o \frac{\partial w^o}{\partial t} + \rho^o v \frac{\partial w^o}{\partial y} = v_\infty \frac{\partial}{\partial y} \mu^o \frac{\partial w^o}{\partial y} + es\,(e_x - w^o + \beta e_z + \beta u^o)$$

$$\rho^o \frac{\partial \theta}{\partial t} + \rho^o v \frac{\partial \theta}{\partial y} = v_\infty \frac{\partial}{\partial y} \mu^o P^{-1} \frac{\partial \theta}{\partial y} - v_\infty \frac{\partial}{\partial y} \left[\mu^o P^{-1} (1 - P) \frac{\partial}{\partial y} (u^{o2} + w^{o2}) \right] +$$
$$+ 2es\,(e_x^2 + e_z^2 - e_x u + e_z u + \beta e_z u + \beta e_z u)$$

$$x - \frac{u_\infty^2}{2h_\infty}, \quad P - \frac{\mu}{k}, \quad \rho - \frac{H^*}{c^2 \rho_\infty}, \quad s = \frac{1}{1+\beta^2}.$$

Using a similarity transformation and expanding the velocities in a power series, the equations take the form

$$u_o'' + 2\eta u_o' = 0 \qquad u_\eta(0) = 0 \qquad u_\eta(\infty) = 1$$

$$w_1'' + 2\eta w_1' \qquad w_1(0) = 0$$

$$u_2'' + 2\eta u_2 - 8u_2 = 4(\tau_1 u_o + \tau_1 w_1) \qquad u_2(0) = 0 \qquad u_2(\infty) = 0$$

$$w_2'' + 2\eta w_2 - 8w_2 \qquad w_2(0) = 0, \quad w_2(\infty) = 0.$$

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ACCESSION NR: AP5013364

In the context of solving these equations, the general problem of obtaining power series solutions for an equation of the type

$$\Phi'' \mp 2\eta\Phi' - 4\Phi = 2f(\eta), \quad |f(\eta)| < A\eta^{-p} \quad (p > 2)$$

is discussed. Similar equations are also obtained for the temperature. An approximate solution of these equations gives the following expression for the Stanton number

$$S = \frac{v_\infty}{u_\infty}(\pi t v_\infty P)^{-1/2}\left[1 - \frac{\alpha g \sqrt{\pi}(1-P)}{1+\alpha - h_w^\circ} - \frac{e t \alpha d \sqrt{\pi}(1-P)}{1+\alpha - h_w^\circ} + \cdots\right]$$

$$h_w^\circ = 1 + \alpha\left[1 - g\sqrt{\pi}(1-P)\right] - 0.5 e t \alpha d\sqrt{\pi}(1-P).$$

Here P is the Prandtl number. Orig. art. has: 69 equations, 1 figure, and 1 table.

ASSOCIATION: none

SUBMITTED: 18Dec64   ENCL: 00   SUB CODE: ME

NO REF SOV: 006   OTHER: 004

Card 3/3

L 43664-66   EWT(1)/EWP(m)/EWT(m)/T   IJP(c)   DS

ACC NR: AP6022522   SOURCE CODE: UR/0040/66/030/003/0441/0450

AUTHOR: Vatazhin, A. B. (Moscow)   73
                                                                      B
ORG: none

TITLE: Electrical fields in magnetohydrodynamic channels in the presence of near--electrode potential drop

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 3, 1966, 441-450

TOPIC TAGS: MHD flow, plasma magnetic field, ionized gas, ELECTRODE PROPERTY, ELECTRIC FIELD, ELECTRODE POTENTIAL

ABSTRACT: The influence of processes near the electrodes of the magnetohydrodynamic channels on the spatial distribution of various physical quantities is formulated and a number of solutions are provided. The electrode systems analyzed in this work are channels with nonconducting, nonparallel walls with certain sections consisting of conductors; various degeneracies are discussed and simplifying assumptions are enumerated permitting approximate solution of the problems. The presence of magnetic field gradients complicates the form of the solutions and it is shown that components of currents normal to the electrodes as well as parallel exist and thus modify the velocity profile. Physical and geometrical limitations of each of the solutions is described to define the range of applicability. This work is based on the theory developed by G. A. Lyubimov and draws on the results of experiments for justification of

Card 1/2

L 43664-66

ACC NR: AP6022522

some of the assumptions necessary to make the problems tractable. Orig. art. has: 8 figures, 26 formulas.

SUB CODE: 20/   SUBM DATE: 15Jan66/   ORIG REF: 014/   OTH REF: 002

Card 2/2 js

ACC NR: AP7003253   SOURCE CODE: UR/0207/66/000/006/0063/0066

AUTHOR: Vatazhin, A. B. (Moscow)

ORG: none

TITLE: Electrical characteristics of a channel with terminal electrodes with allowance made for potential drop at these electrodes

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 6, 1966, 63-66

TOPIC TAGS: electrode potential, approximation method, electrode parameter

ABSTRACT: Spatial problems determining the electric field in a magnetohydrodynamic channel with due allowance for electrode potential drop have been formulated using the condition of low electrode layer thickness, which permits extending the relationships on the layer boundary to the electrode surface and assumes the possibility of representing the dependence of potential drop $\delta\phi^o$ at the electrodes on current density j_n^o on the electrode in the form of the known function $\delta\phi^o = f(j_n^o)$ determined by experiment or from the pertinent electrode layer theory. An approximate method of solving such problems has previously been proposed which reduces them to a calculation of the electric field from the known distribution of the magnetic field and of the gas-dynamic parameters. One of these problems defines the electrical current in a channel with a single pair of symmetrical electrodes. In the first approximation its solution

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ACC NR: AP7003253

is found in the form of a Keldysh-Sedov integral formula. The present paper analyzes this solution for the case of a step relationship of $\delta\phi^o$ along the electrodes. The channel studied has height h with two symmetrical electrodes 2λ long. A medium of constant conductivity σ in magnetic field $B^o = (0, 0, -B^o(x^o))$ moves along the channel with velocity $v^o = (V^o(x^o), 0, 0)$. Interaction of field and medium between the electrodes generates potential difference $\phi^{o+}-\phi^{o-}$ (considered as given) and current J^o to be determined flows along the load connecting the electrodes. The paper concludes that the corollaries it draws from the solution studied are solutions of versions of the problem when $\phi^{o+}-\phi^{o-} = 0$. Orig. art. has: 9 formulas and 2 figures.

SUB CODE: 09/ SUBM DATE: 01Sep66/ ORIG REF: 006/ OTH REF: 001

Card   2/2

VATAZHINA, ANTONINA

RAYKHMAN, Adol'f Borisovich; VATAZHINA, Antonina Afanas'yevna; ZELINGER,
    Ivan Ivanovich; CHERNIKOV, A.P., redaktor; GABERLAND, N.I.,
    tekhnicheskiy redaktor

[Employment of disabled with injuries of the extremities in
agriculture] Trudovoe ustroistvo v sel'skom khoziaistve invalidov
s povrezhdeniem konechnostei. Moskva, Gos. izd-vo med. lit-ry,
1956, 66 p.   (MLRA 10:4)
        (HANDICAPPED--EMPLOYMENT)   (AGRICULTURAL LABORERS)

VATAZHINA, V., kand.tekhn.nauk; PANKRATOV, V., inzh.

Sealing for joints of large-panel buildings. Na stroi. Ros. 4
no.5:26 My '63.   (MIRA 16:5)
                    (Building—Details) (Polymers)

VATAZHINA, V., kand. tekhn. nauk; KHOMENKO, Z., kand. tekhn. nauk;
PANKRATOV, V., inzh.; PANFEROVA, A., inzh.; POMANSKAYA, M.,
inzh.; DEMINA, Ye., inzh.

Modern joint-sealing materials in housing construction.
Zhil. stroi. no.9:5-6 '65.   (MIRA 18:11)

PROVINTEYEV, I. V., kand. tekhn. nauk; VATAZHINA, V. I., kand. tekhn. nauk; LUTSYUK, V. Z., inzh.

Using rubber of depreciated goods for the manufacture of waterproofed film materials. Sbor. trud. VNIINSM no.5:65-74 '61.   (MIRA 15:10)

(Rubber)   (Waterproofing)

VATAZHINA, V. I.

Vatazhina, V. I.

"The Effect of Vulcanization Accelerators on the Properties of Tire Rubbers Made from Butadiene-Styrene Rubber." Moscow Inst of Fine Chemical Technology imeni M. V. Lomonosov. Sci Res Inst of the Tire Industry. Moscow, 1955. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Knizhnaya Letopis', No. 27, 2 July 1955.

PROVINTEYEV, I.V.; BURLACHENKO, P.Ye.[deceased]; VATAZHINA, V.I.;
PANKRATOV, V.F.; ZAYCHIKOVA, E.A., red. izd-va; MOCHALINA,
Z.S., tekhn. red.

[Waterproofing, roofing and sealing materials] Gidroizo-
liatsionnye, krovel'nye i germetiziruiushchie materialy.
Moskva, Gosstroiizdat, 1963.   230 p.   (MIRA 16:6)
           (Building materials)

VATAZHINA, V.l., kand. tekhn. nauk; PANKRATOV, V.F., inzh.

Sealing materials for large-panel construction. Sbor. trud.
VNIINSM no.7:41-47 '63.   (MIRA 17:11)

L 25662-66   EWT(m)/EWP(v)/EWP(j)/T   IJP(c)   WW/DJ/RM

ACC NR: AM5028686   Monograph   UR/

Vatazhina, V. I. (Candidate of Technical Sciences); Munts, V. O. (Candidate of Architecture); Pankratov, S. I. (Engineer); Gershikov, B. M. (Engineer); Sadagashvili, G. R. (Engineer)

Hermetic sealing materials for structural elements   (Germetiziruyushchiye materialy dlya stroitel'nykh konstruktsiy)   Moscow,   Stroyizdat,   65.   0146 p. illus., biblio.   (At head of title: Gosudarstvennyy komitet po promyshlennosti stroitel'nykh materialov pri Gosstroye SSSR. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov) Errata slip inserted. 3,000 copies printed.

TOPIC TAGS: general construction, construction material, civil engineering, hermetic seal, synthetic material. structural plastic

PURPOSE AND COVERAGE: This book gives a survey of the development in the Soviet Union and abroad of the problem of hermetically sealed seams of external aggregate elements. All types of sealing materials used in constuctuion are viewdd. Engineering of the production of principle hermetic sealing materials used in large panel construction is also covered. The book presents means of applying the materials and technical characteristics of the apparatus and equipment necessary for mechanized application of hermetic   of the seams of buildings and structures. Special attention is given to methods of testing hermetic seals and means of determining their water and air penetrability which permit insepction of materials in similated working conditions. The book also gives data of comparative economic

Card 1/2   UDC: 691.17:624.078

L 25662-66

ACC NR: AM5028686   /

effectiveness in using hermetic sealing in large panel construction. This book
is recommended for engineers and technicians in the industry of synthetic building
materials, for workers of project organizations and building manufacturers.

TABLE OF CONTENTS (abridged):

SUB CODE: 11,13/ SUBM DATE: 13Mar65/ ORIG REF: 067/ OTH REF: 023

Card2/2 dda

S/812/61/000/005/003/005

AUTHORS: Provinteyev, I.V., Candidate of Technical Sciences, Vatazhina, V.L.,
Lytsyuk, V.Z., Engineer.

TITLE: The re-use of second-hand rubber in the making of film-type water-
proofing materials.

SOURCE: Akademiya stroitel'stva i arkhitektury SSSR. Institut novykh
stroitel'nykh materialov. Sbornik trudov. no.5. 1961. Novyye
stroitel'nyye polimernyye materialy. pp. 65-74.

TEXT: The paper discusses the possible re-use of old rubber in the making of
water-proofing film material for building roofs, foundations, and vapor-barrier
and heat-insulating batting and inserts. The enormous amount of unreclaimable
old rubber and rubber-industry waste in the country constitutes a potential inexpen-
sive and ample source of usable raw material. By 1980 the amount of unreclaim-
able old tire casings and industrial wastes should amount to several millions of
tons. In recent times, attempts to use finely mechanically-chopped rubber from
old casings have led to the development, by the Scientific Research Institutes for
the tire industry and for asbestos and cement, of a technology for the making of
brizol and izol, both of which are highly elastic, freeze-resistant, water-resistant,

Card 1/4

The re-use of second-hand rubber in the making ...   S/81$/61/000/005/003/005

and strong. The rubber crumbs are thermally and mechanically treated in Mark-V bitumen in closed mixers, a filler is added, and sheets 2-mm thick are calendered to size. By 1965 industrial production of izol should attain 93 million m^2, that of brizol 70 million m^2. Yet, the remaining 300-500,000 tons/yr of old tire-casing rubber continue to seek useful application. The water-barrier characteristics of a film are governed primarily by the material and not by the thickness; the 1.5-2.0 mm thickness of production film is dictated by strength requirements. In 1960 the All-Union Scientific Research Institute of New Building Materials of the Academy of Construction and Architecture, USSR, developed the following process: (1) Repro-cessing of rubber crumbs obtained by the method of the All-Union Scientific Research Institute of Film Materials and Artificial Leather, namely, by soaking strips of casings in white spirit and removing the cord fibers therefrom, so that both of them may be re-utilized; (2) reprocessing of various rubber wastes without comminution of the lump-size pieces. Apparatus was developed for investigations of various factors, such as mechanical action, temperature, softeners, O, and activators, on the regeneration process. One such apparatus is an autoclave in which rubber exposed to softeners is submitted to mechanical destruction between rotating coni-cal surfaces and the walls of the apparatus and wherein the material is force-fed into the destruction zone by means of gear pumps (for more fluid pastes) and worm pumps (for the thicker masses). The apparatus is being designed currently at the

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S/812/61/000/005/003/005

The re-use of second-hand rubber in the making ...

above-named Institute of New Building Materials. The same Institute has also developed the bitumen method of simultaneous destruction of piece rubber and extraction of the solvent from the rubber. The process of preparing a regenerate from resin crumbs is described (cross-section of process flow shown). The resulting rubber suspension can be used: (1) For the making of waterproofing paints and impregnators; (2) for the production of waterproofing film materials; (3) as an additive to Mark-V bitumen to improve its elasticity and freeze-resistance; (4) for the production of vulcanized shaped parts (batting, inserts, etc.); (5) for the production of mastic compositions for the filling of seams and the making of seamless water-impervious layers. The preparation of a regenerate from large lumps of rubber by the bitumen method is described in detail. Various softeners were tested, including Diesel oil, residual post-phenol purification distillate, Mark-III bitumen, and the products of the deasphaltization of gudron (petroleum asphalt flux). Diesel oil, the residual extracts of the phenol purification of oils, and the gudron-deasphaltization products were found to be the most effective. The making of waterproofing film materials from the regenerates is described. It is shown that the concentrated suspension of rubber destructed in the last-named softeners can be formed into vulcanized film materials with a strength of 20-34 kg/cm^2, a relative elongation of 60-200%, also into nonvulcanized rot-resistant water-proofing materials with a strength of 10-13 kg/cm^2 with an elongation of 30%. The specific

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The re-use of second-hand rubber in the making ...   S/812/61/000/005/003/005

applications of each type of film material thus obtained are detailed. It is recom-
mended that development organizations and the industry undertake the formal estab-
lishment of process technologies and equipment designs for industrial utilization of
the processes outlined here.   There are 1 figure and 2 tables; no references.

ASSOCIATION: None given.

Card 4/4

PA 12/49T57

VATCHAGANDI, D. S.

USSR/Engineering   Sep 48
      Refractories
      Refractory Materials

"The Production of Refractories in India," D. S.
Vatchagandi and Ye. V. Gokhman, $\frac{1}{2}$ P

"Ogneupory"   Vol XIII, No 9

Lists refractories now manufactured in India.
(D. S. Vatchagandi, "Iron and Steel," 1947).

FDB   12/49T57

VATCHENKO, A.

Stimulate the fighting spirit of trade-union organizations. Sov.
profsoiuzy 18 no.13:4-6 Jl '62.   (MIRA 15:6)

1. Pervyy sekretar' Khmel'nitskogo oblastnogo komiteta Kommunisticheskoy
partii Ukrainy.
            (Khmel'nitskiy Province--Trade unions)

VATCHENKO, G. [Vatchenko, H.]; OGRYZKINA, O. [Ohryzkina, O.];
    STRUCHKOVA, N.; KHANIAS-NIBO, M.; CHERNYKH, O.; CHUMACHENKO, V.;
    SHEVCHENKO, G. [Shevchenko, H.]; DEMERDZHI, D., red.; SHTEYN, M.,
    red.; KOLOMOYTSEVA, F., tekhn.red.

    [Dnepropetrovsk; reference-guidebook] Dnipropetrovs'k; dovidnyk
    putivnyk. Vyd.2., vypravlene i dop. Dnipropetrovs'k. Dnipro-
    petrovs'ke knizhkove vyd-vo, 1959. 300 p.   (MIRA 13:8)

    1. Dnepropetrovskiy gosudarstvennyy istoricheskiy muzey (for all,
    except Demerdzhi, Shteyn, Kolomoytseva).
                (Dnepropetrovsk--Guidebooks)

AZERNIKOV, V.; ARLAZOROV, M.; ARSKIY, F.; BAKANOV, S.; BELOUSOV, I.;
        BILENKIN, D.; VASEL', I.; VLADIMIROV, L.; GUSECHEV, S.;
        YELAGIN, V.; YERESHKO, F.; ZHURBINA, S.; KAZAKOVSKAYA, G.;
        KALININ, Yu.; KELER, V.; KONOVALOV, B.; KREYNDLIN, Yu.;
        LEBEDEV, L.; PODGORODNIKOV, M.; RABINOVICH, I.; REPIN, L.;
        SMOLYAN, G.; TITARENKO, V.; TOPILINA, T.; FEDCHENKO, V.;
        EYDEL'MAN, N.; EME, A.; NAUMOV, F.; YAKOVLEV, N.;
        MIKHAYLOV, K., nauchn. red.; LIVANOV, A., red.

        [Little stories about the great cosmos] Malen'kie rasskazy o
        bol'shom Kosmose. Izd.2., Moskva, Molodaia gvardiia, 1964.
        368 p.   (MIRA 18:4)

VATEL' I.A.; VOL'FSON, I.YE.; YERESHKO, F.I.; LEBEDEV,V.N. (Moscow):

"Some problems of the theory of optimum transfers".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964.

VATERA, E.

Internal photoeffect and photodesorption of oxygen in zinc oxide. St. Kynev and El. Vateva. *Compt. rend. acad. bulgare. sci.* 12, 33-6(1959)(in Russian).—The temp. dependence of photodesorption of O was studied by cond. and photocond. measurements of ZnO. Photodesorption of O takes place not only in the region of absorption of light, but also at longer wave lengths. The temp. dependence of the desorption, the magnitude and kinetics of the photoeffect, and the influence of adsorbed O are described. The results obtained by simultaneous application of high-frequency voltage and d.c. voltage also are given.

A. Libackyi

S/081/62/000/023/111/120
B117/B186

AUTHORS: Straubel, Horst, Vaterodt, Hermann, Weiß, Johannes,
               Wilde, Herbert

TITLE: Method of joining thermoplastics parts to plastics products
               containing parts sensitive to heat and pressure

TEXT: A compression mold for joining thermoplastics parts to plastics
products is distinguished by having annular enlargements at the edges of
the mold cavity. These enlargements impose sudden changes of direction
on the entering flow of plastic material so that the product is not
damaged by heat effect. The regions of the mold in contact with the
product are made of material having low thermal conductivity. Such a
design prevents deformation and overheating of the adjacent areas of the
product resulting from deliquescence of hot plastic material under
pressure over these areas. [Abstracter's note: Complete translation.]

Card 1/1

Distr: 4E3d/4E2o/4E3q

Use of the electrically stimulated current in single crystals of cadmium sulfide for measurement of γ-ray dosage. A. M. Borisov, St. Kanev, I. Georgieva, and E. Vateva.. *Compt. rend. acad. bulgare. sci.* 11, 25-8(1958)(in Russian).—Co⁶⁰ was used to supply γ-rays to bombard single crystals of CdS made by the Frerichs method *C.A.* 44, 1208*i*. The dark current of the crystal depends on the total dosage. For reproducibility, the crystals required "tuning" by application of a large voltage (18 v. for 5 sec. followed by 20 v. for 115 sec.), and, initially, small fluctuations of temp. around room temp. The deflection of a galvanometer in series with the crystal recorded the dosage. With increasing dosage the deflection rose at an increasing rate, until the crystal became satd. The satn. current was 350 microamp. for a total dosage of 1 r. The curve for γ-radiation is very similar to that obtained for light. The deflection also depended upon the time between the exposure and the measurement, falling with time to a const. value after about 5 hrs. The measured dose was independent of the radiation intensity to, within a few %. Different crystals showed varying sensitivity, the selection for dosimetery being made on the basis of the dark current before exposure. This dark current was as low as 2-3 × 10⁻⁸ amp. The reproducibility and sensitivity permitted measurements to a few mr.

S. E. Babb, Jr.

VATEVA, E.; BLIZNAKOV, G.

Effect of some gases on the semiconductor properties of
iron-chromium catalyst. Doklady BAN 16   no. 4: 393-396
'63.

1. Submitted by Academician R. Kaishev.

VATEVA, E.: GEORGIEVA, L.

"Solar batteries"

Fiziko-Matematichesko Spisanie. Sofiia, Bulgaria. Vol. 1, no. 3/4, 1958

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 6, Jun 59, Unclas

KYNEV, S. [Kunev, S.]; KLISURSKI, D.; VATEVA, E.

Semiconducting properties of some cobalt oxide catalysts, and the catalytic oxidation of ammonia. Doklady BAN 15 no.1:61-64 '62.

1. Predstavleno akad. R. Kaishevym.

KUNEV, St.; KLISURSKI, D.; VATEVA, El.

Semiconducting properties of some cobalt-oxide catalysts, and catalytic oxidation of ammonia. Izv fiz atom BAN 9 no.2:57-72 '62.

VATEVA, El.

"Photoconductivity of solids" by R. Buiub. Reviewed by
El. Vateva. Fiz mat spisanie BAN 6 no. 3:221-222 '63.

BORISOV, M.; KUNEV, St.; GEORGIEVA, L.; VATEVA, E.

    Electric stimulated currents in cadmium sulfide monocrystals.
    Godishnik fiz mat 53 no.2:59-71 '58/'59 [publ. '60].

30415

9,4177 (1035, 1051, 1114)

26.2421

8/058/61/000/009/036/050
A001/A101

AUTHORS: Borisov, M., Kynev, St., Vateva, Ye., Georgiyeva, I.

TITLE: On electrically stimulated currents in single crystals of cadmium
sulfide subjected to irradiation by light

PERIODICAL: Referativnyy zhurnal, Fizika, no. 9, 1961, 224, abstract 9E372
("Dokl. Bolg. AN", 1960, v. 13, no. 1, 23-26, German summary)

TEXT: Electrically stimulated currents arising at irradiation of CdS sing-
le crystals by visible light were investigated. The curve showing the magnitude
of stimulated currents as a function of the absorbed light portion is presented
and compared with the kinetic curve of photocurrent obtained at the same illu-
mination. The intensity of stimulated currents is by far greater, consequently
it is more suitable for measuring weak intensities of light. At a constant dose
of irradiation, the intensity of stimulated current does not depend on illumina-
tion intensity and rises with the growth of voltage applied to the crystal. With
the course of time, crystals spontaneously emit a portion of absorbed energy.
Methods of eliminating this phenomenon have been found. There are peaks (from
two and more for different crystals) in dependence on the intensity of stimulat-

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On electrically stimulated currents ...

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8/058/61/000/009/036/050
A001/A101

ed current. The peak positions of electrically and thermally stimulated currents coindide, which indicates a close connection between the both phenomena. The results may be relevant also to other Kinds of radiation to which CdS is sensitive.

V. Patskevich

[Abstracter's note: Complete translation]

Card 2/2

L 64686-65   T/EWP(t)/EWP(b)/EWA(c)   IJP(c)   JD

ACCESSION NR: AP5012379   GE/0030/65/009/002/K087/K090

AUTHOR: Kanev, S.; Koparanova, N.; Vateva, E.

TITLE: A method for determining the type of contacts applied to single crystals of CdS, CdSe, etc.

SOURCE: Physica status solidi, v. 9, no. 2, 1965, K87-K90

TOPIC TAGS: photosensitivity, cadmium selenide, cadmium sulfide, single crystal, photoelectric cell

ABSTRACT: A new method is proposed for determining the type of electrode contact in photosensitive homogeneous single crystals. The method is based on a phenomenon described as follows. The specimen is illuminated, and when a stationary photo-current value is reached the voltage U is switched off for a short time t_{off}. With reapplication of the voltage, the photocurrent does not immediately reach the sta-tionary value, but increases gradually (see fig. 1 of the Enclosure, d curve 2). A detailed study of this effect (called the "switch-off" effect) revealed that it is more pronounced for blocking contacts. If the contact is not strongly blocking, the intensity of the illumination and the switch-off time must be properly selected

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L 64686-65

ACCESSION NR: AP5012379   6

for observation of the switch-off effect. Injection cathodes give a photocurrent
peak after short t_{off} periods. These facts were used to check various types of con-
tacts in 80 CdS and several CdSe single crystals. It was found that the switch-off
effect is a useful method for roughly determining the type of contact on photosen-
sitive single crystals. This method is simple and requires only a short time for
measurements. However, it should be noted that the switch-off effect may occur in
the case of injection cathodes if the negative space charge injected is balanced by
holes. This may be caused either by strong illumination in the anode region or by
hole injection from the anode. In this case, these complications may be useful
for more detailed studies of carrier injection and its effects on photoconductivity.
art. has: 1 figure.

                                                        24.55

SUBMITTED: 15Mar65   ENCL: 1   OTH REF: 11

NO REF SOV: 000   OTHER: 008

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L 64686-65

ACCESSION NR: AP5012379

ENCLOSURE: 01
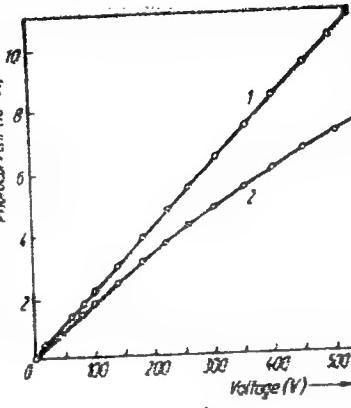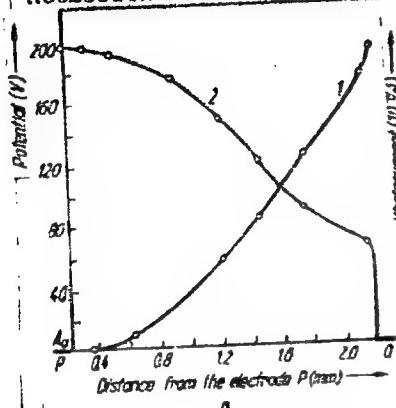
Fig. 1. Results of different methods for determining the type of contacts applied to a single crystal. a) Potential distribution along the surface between the electrodes, b) current-voltage characteristics, c) photocurrent measurements with sample illumination, d) switch-off-effect. (1)--electrode P is cathode; (2)--electrode Q is cathode. In a), b), and d) the crystal is weakly and uniformly illuminated.
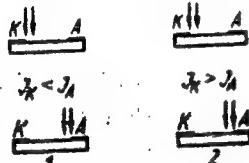
Card 3/3 dm
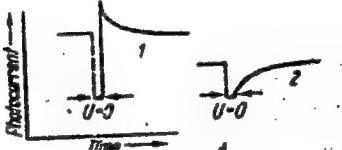
VATEVA, E.; KUNEV, S.

"Inner photoelectric effect and photodesorption of oxygen in zinc oxide." In Russian. p. 33

DOKLADY. Sofiia, Bulgaria, Vol. 12, No. 1, January/February, 1959.

Monthly List of East European Accessions (EEAI), LC, Vol. 9, No. 2, February, 1960. Uncl.

L 4340-66   EWT(1)/T/EWP(t)/EWP(b)/EWA(h)   IJP(c)   JD/AT

ACC NR: AP5028770   SOURCE CODE: BU/0011/65/018/002/0101/0104

AUTHOR: Kynev, S.; Vateva, E.; Koparanova, N.

ORG: Physics Institute, Bulgarian Academy of Sciences (Fizicheskiy institut, Bolgarskoy akademii nauk)

TITLE: Method for the determination of the type of contacts in CdS, CdSe and other crystals

SOURCE: Bulgarska akademiya na naukite, v. 18, no. 2, 1965, 101-104

TOPIC TAGS: crystal, cadmium sulfide, cadmium selenide, semiconductivity, dielectrics

ABSTRACT: [Russian article] The determination of the kind and properties of contacts in semiconductors and dielectrics is of importance not only for the process of design of practical instrumentation but also for the study of underlying physical events. There exist presently only a few methods for determining the kind of contact   (W. H. Buttler, W. Huscheid, Ann. Physik, 15, 1954, 1; K. Boor, K. Lubitz, Z. Naturforsch., 17, a. 1962, 397) and they are not always reliable. A new simple and fast method is proposed here for the determination of the kind of contact on photosensitive homogeneous CdS, CdSe, and other crystals. The method is based on an effect described earlier by two of the authors (S. Kanev, N. Koparanova, Compt. rend. Acad. bulg. Sci., 17, 1964, 5) which appears only in case when the cathode contact is a shut-off one.   The article contains graphs representing typical cases.

Card 1/2

L 4340-66

ACC NR: AP5028770

The work was presented by G. Nadzhakov, Academician, 10 Oct64. Orig. art. has: 3 figures.

SUB CODE: SS / SUBM DATE: 10Oct64 / ORIG REF: 002 / OTH REF: 006
SOV REF: 002

Card 2/2

L 4347-66   EWT(1)/T/EWP(t)/EWP(b)/EWA(h)/EWA(c)   IJP(c)   JD/AT

ACC NR: AP5028771   SOURCE CODE: BU/0011/65/018/002/0105/0108

AUTHOR: Vateva, E.

ORG: Physics Institute, Bulgarian Academy of Sciences (Fizicheskiy institut, Bolgarskoy akademii nauk)

TITLE: Negative resistance in CdS

SOURCE: Bulgarska akademiya na naukite, v. 18, no. 2, 1965, 105-108

TOPIC TAGS: cadmium sulfide, single crystal, semiconductivity, recombination radiation, electric resistance

ABSTRACT: /English article/ Practical application of negative resistances in semiconductors and insulators prompted in recent years a lively research activity. In the case of CdS, negative resistance has been observed primarily by the studies of recombination radiation and double-carrier injection following the theoretical concepts developed by Lampert (Phys. Rev., 1962, 125, 126; Proc. IRE, 50, 1962, 1781) and Stolle, Ando and Lampert (J. Phys. Soc. Japan, 17, 1962, 1729) and others. Litton and Reynolds (Phys. Rev. 133, 1964, 2A) have later continued the study of negative resistance and double injection. They investigated select CdS crystals, so-called tap crystals, in which mechanically stimulated emission and typical accumulating effect (storing of high conductivity) after optical stimulation at low temperatures (77^0 and

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L 4347-66

ACC NR: AP5028771

4.2° K) were observed. They established that no negative resistance can be
obtained without optical stimulation even with an increased voltage up to the
breakdown point or a field-induced light emission. The present paper studies
the conditions under which negative resistance appears in CdS single crystals
in the presence of two ohmic electrodes. Tests with select specimens show
that certain phenomena are observed at room temperature; they are analogous
to those observed in the crystals at low temperatures. The investigations
will be broadened in the future by studies with other contacts and temperatures;
the results could then be utilized in the study of recombination radiation
with suitable crystals and in clarifying the generations in CdS connected
with IR radiation and stimulation with visible light (see, K"nov, Marinova,
Zhulov, Izv. FI s ANEB, BAN, 1964). The work was presented by G. Nadjakov, Academician,
17 Oct 64. Orig. art. has: 2 figures. /JPRS7

SUB CODE: SS / SUBM DATE: 17Oct64 / ORIG REF: 003 / OTH REF: 009

Card 2/2

L 8973-66   EWT(1)/EWP(t)/EWP(b)   IJP(c)   JD

ACC NR: AP5027422   SOURCE CODE: UR/0181/65/007/011/3402/3404

AUTHOR: Vateva, Ye.

ORG: Physics Institute, Bulgarian AN, Sofia (Fizicheskiy institut Bolgarskoy AN)

TITLE: Conditions for producing stable negative resistance in CdS

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3402-3404

TOPIC TAGS: cadmium sulfide, IR phenomenon, IR research, single crystal

ABSTRACT: The author compares various current-voltage curves for CdS with two ohmic electrodes and with one ohmic and one blocking electrode, and studies the effect of infrared radiation on the negative resistance and on the conductivity of specimens at room temperature. The specimens were CdS single crystals 10-100 μ thick grown from the gaseous phase. These crystals displayed considerable IR quenching. Sandwich type electrodes were used. The ohmic contacts were made from indium vaporized after electron bombardment of the crystal surface, while the blocking contacts were made from vaporized copper, and in some cases from vaporized gold and tellurium. The ratio between threshold voltage and minimum voltage in the negative resistance region was taken as the characteristic parameter. This ratio is reduced, and negative resistance occurs at lower voltages as the preliminary IR excitation of the crystal is increased. Studies of conductivity as a function of IR radiation for a given voltage close to the

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L 8973-66
ACC NR: AP5027422

negative resistance range revealed an infrared photoelectric effect above a certain
voltage in all strongly rectifying diodes, which increased with a reduction in dark
quasistationary conductivity. No positive photoelectric effect was observed in speci-
mens with two ohmic contacts. Theoretical explanations are given for some of the ob-
served phenomena. Orig. art. has: 2 figures.

SUB CODE: 20/   SUBM DATE: 24Mar65/   ORIG REF: 001/   OTH REF: 005

Card 2/2

S/194/61/000/012/060/097
D201/D256

26.1512

AUTHORS: Borisov, M., Kynev, St., Vateva, Ye. and Georgiyeva, I.

TITLE: Electrically stimulated currents in irradiated mono-crystals of cadmium sulphide

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 13, abstract 12379 (Dokl. Bolg. AN, 1960, v. 13, no. 1, 23-26)

TEXT: This is a description of the results of analysis of electrically stimulated currents (ESC), originated with the superimposition of voltage on a previously irradiated CdS crystal. The magnitude of ESC depends in general not on the intensity of irradiation, but on its dosage. With the increase of dose the ESC increases up to a certain limit, beyond which saturation occurs. With the increase of the voltage applied to the crystal the ESC increases monotonically so that it is impossible in this way to detect the electron energy traps. The graphs of ESC against the

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Electrically stimulated currents ...   S/194/61/000/012/060/097
                                         D201/D303

temperature exhibit 2 maxima (-80 and +80^{C}C), showing different
levels of electron traps. The positions of thermally and electri-
cally stimulated electric current maxima coincide with each other
which shows a close interdependence of the two phenomena. /'Ab-
stractor's note: Complete translation. /

Card 2/2

VATEVA, Yel.

BULGARI./Nuclear Physics - Installations and Instruments. Methods   C-2
        of Measurement and Research

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 7487

Author   : Borisov M., Kinev St., Georgiyeva I., Vateva Yel.
Inst   : -
Title   : Use of Electrically Stimulated Currents in Single Crystals
           of Cadmium Sulfide for the Measurement of Doses of Gamma Rays

Orig Pub : Dokl. Bolg. AN, 1958, 11, No 1, 25-26

Abstract : An electrically stimulated current is a brief current pulse,
           occurring in CdS crystals, exposed to light or to ionizing
           radiations when an electric field is applied to the crystal.
           The magnitude of the pulse depends on the radiation does and
           is independent on the dose intensity. The sensitivity
           limit is determined by the dark current, arising under the
           influence of the electric field in unexposed crystals. As
           the dose is increased, saturation occurs, i.e., the pulses
           do not increase with increasing dose. The method makes it
           possible to measure doses within limits from several milli-
Card   : 1/1   roentgens to one roentgen. -- K.K. Aglintsev

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VATHY, Istvan, dr.

Pharyngeal fibroma. Ful orr gegegyogy. no.4:124-126 Nov 55

1. A Budapesti Orvostudomanyi Egyetem Ful-, Orr-, Gegeklinikajanak
(igazgato: Varga Gyula dr. egyet. tanar) kozlemenye.
         (FIBROMA
              pharynx, surg.)
         (PHARYNX, neoplasms
              fibroma, surg.)

VATHY, Istvan, dr.; RIBARI, Otto, dr; ORAWETZ, Otto, dr.

Clinical aspects and treatment of benign tumors of the nasal
sinuses based on 15-years' experience. Orv. hetil. 105 no.21:
968-971   24 My'64

1. Budapesti Orvostudomanyi Egyetem, Ful-orr-gegeklinika.

VATHY, Istvan, Dr.

Nose bleedings and their management. Ful orr gegegyogy 4 no.2:70-74
June 58.

1. Budapesti Orvostudomanyi Egyetem Ful-orr-gegeklinikajanak (Igazgato:
Varga Gyula dr. egyetemi tanar) kozlemenye.
    (EPISTAXIS, ther.
        (Hun))

VATHY, Istvan, dr.

Difficulties in diagnosing laryngeal cancer. Fulorrgegegyogya-
szat 10 no.1:37-40   Mr '64

1. A Budapesti Orvostudomanyi Egyetem Ful-orr-gegeklinikajanak
(igazgato: Varga, Gyula,dr., egyetemi tanar) kozlemenye.

*

VATHY, Istvan, dr.

Nose and sinus neoplasms. Fulorrgegegyogyaszat 9 no.3:97-120
S '63.

(NOSE NEOPLASMS)   (PARANASAL SINUS NEOPLASMS)
(CARCINOMA)   (CYLINDROMA)   (MELANOMA)
(NEOPLASM ETIOLOGY)

VATHY, Istvan, dr.

> Problems of surgical treatment of the frontal sinus diseases.
> Ful orr gegegyogy 6 no.3:128-132 S '60.
>
> 1. A Budapesti Orvostudomanyi Egyetem Ful-orr-Gegeklinikajanak
> (Igazgato: Varga Gyula dr. egyet tanar) kozlemenye.
>   (FRONTAL SINUS surg.)

VATI, I.

Significance of biopsy in otorhinolaryngology. Vest. otorin. 22
no.4:15-19 Je-Ag '60.   (MIRA 13:12)
          (OTOLARYNGOLOGY)   (BIOPSY)

24860   S/108/61/016/009/002/002
              D202/D306

9,2580

AUTHORS: Vatin, I.M., and Meyerovich, L.A.

TITLE: Stabilizing properties of a magnetic pulse
             generator

PERIODICAL: Radiotekhnika v. 16, no. 9, 46 - 54

TEXT: Although the theory of magnetic pulse generators fed
from alternating sources has been studied by several workers
(Ref. 3: L.A. Meyerovich, L.G. Zelichenko, Trudy, VKAS No.53,
1956) the solution of the problem of dependence of the gener-
ator pulse amplitude on e.g. the capacity of 1st condenser, has
not, as yet, been given. A knowledge of it is necessary for
the sake of correct assessment of the generator elements and
this is what the authors derive in the present article. They
assume that the generator operates in a pre-determined regime,
namely in the regime with one saturation only, the character-
istic of which is also given in the article. Considering the

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D202/D306

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schematic diagram of the magnetic pulse generator as shown in Fig. 1 the problem of the formation of the voltage pulse at the capacitor C_2 is discussed for operation with one saturation state of core L_1. It is shown that the amplitude of the pulse capacitor C_2 and the amplitude of output pulses therefore, does not depend on the amplitude of the supply voltage. It is shown subsequently that the value of C_1, losses in C_1, L_1 and T_{r2} determine the length τ of the pulse of the 2nd capacitor but since τ is very small as compared with the period of the driving voltage T, changing these parameters even within very wide limits would affect very little, only the pulse amplitudes. As an illustration an example of a highly stable experimental pulse generator is given and discussed. The peak pulse power was 300kW, duration of pulse 1.25 microsecond, repetition frequency 400c/s, circuit diagram as shown in Fig. 1. All results obtained show that changing the relevant generator parameters influences little, if at all, the amplitude of generated pulses.

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Changes observed at the extreme of the range are due to secon-
dary saturations which was confirmed on a CRO. It is stated
in conclusion that the analysis of processes occuring in the
state with one saturation only, as confirmed by many experi-
ments, shows high operating reliability and important design
and technical advantages of a magnetic pulse generator. A
high degree of amplitude stability of generated pulses can be
achieved, this amplitude being independent both of the supply
voltage and of parameters of the generator itself. There are
8 figures and 3 references: 2 non-Soviet-bloc and 1 Soviet-
bloc. The references to the English-language publications read
as follows: W.S. Melville, PIEE, part III, v. 98, no. 53 1951;
K.J. Busch, A.D. Hasley and Carl Neitzert, BSTJ no. 34 Sept.
1955.

SUBMITTED: September 19, 1960

Card 3/4

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Stabilizing properties...

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D202/D306
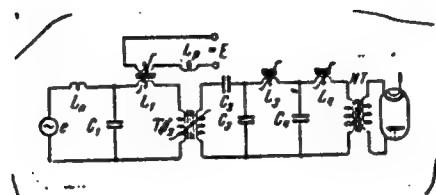
Fig. 1

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S/108/62/017/005/002/007
D407/D301

24,2300

AUTHORS: Vatin, I. M., Zaytsev, E. F. and Meyerovich, L. A.

TITLE: Study of stationary oscillations in a magnetic pulse
             generator

PERIODICAL: Radiotekhnika, v. 17. no. 5, 16-25

TEXT: The equation for the oscillations is derived and its solu-
tion found for the case of asymmetric stationary oscillations with
period 2 ; their stability is investigated. The asymmetric regime
of stationary oscillations was chosen, as being of greater practical
interest. A block diagram of the magnetic pulse-generator is shown.
The processes between 2 saturations of the choke L are described
by the differential equation

$$\frac{1}{b^2} \cdot \frac{d^2 u_1}{dt^2} + \frac{d}{b} \cdot \frac{du_1}{dt} + u_1 = \sin(t + \Psi) - \frac{d}{2b} M \qquad (3)$$

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Study of stationary ...

where the dimensionless variables

$$t = \omega\mathcal{T}, \quad u_1 = \frac{u_{c1}}{U_m}, \quad i_1 = \frac{du_1}{dt} = \frac{i_{c1}}{U_m\omega C_1}$$

are used, as well as the dimensionless coefficients $b = \omega_1/\omega$ -- the charging-circuit parameter, d -- the damping, M -- the magnetization coefficient, and ψ -- the phase of the supply voltage at the moment of saturation of the choke. The general solution of Eq. (3) is

$$U_1 = V \sin(t + \psi + \varphi) + Ae^{-\frac{bd}{2}} \sin(b_1 t + \theta) - \frac{d}{2b} M \qquad (4)$$

where $b_1 = b\sqrt{1 - d^2/4}$. The solution of Eq. (3), in the interval

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Study of stationary ...

between the (k-1)-st and k-th saturation of the choke is denoted by $u_{1(k)}$ and $i_{1(k)}$. Thereupon, a system of recursion (difference-) equations

$$i_{1(k+1)}(0) = i_{1(k)}(T_k)$$

$$u_{1(k+1)}(0) = q_1 u_{1(k)}(T_k)$$

$$\Psi_{k+1} = \Psi_k + T_k$$

$$(7)$$

is obtained, where T_k is the time lapse between 2 consecutive saturations of the choke. Eqs. (7) are nonlinear. T_k is determined by two transcendental equations, the first of which being

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Study of stationary ...

$$\int_{0}^{\frac{T}{2}k} u_{1(k)} dt = 0 \tag{8}$$

In the case of an asymmetric regime of stationary oscillations, cha-racterized by the fact that the choke L is saturated only once dur-ing the period of oscillations, one obtains the solution of system (7) in the form of 3 expressions (for A and θ), and equation

$$\sin(\psi + \varphi) = \frac{1}{V}\left(- A\sin\theta + \frac{d}{2b}M\right) = -\frac{\pi M}{V}\left(S - \frac{d}{2\pi b}\right) \tag{17}$$

for ψ; hence the phase ψ is not uniquely determined; the system has 2 solutions: $u_1^{(1)}(t)$ and $U_1^{(2)}(t)$, corresponding to $\cos(\psi + \varphi) > 0$ and

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Study of stationary ...

$\cos(\psi + \varphi) < 0$, respectively. The stability of the obtained solutions is analyzed by means of Lyapunov's theorem and Hurwitz's criterion. It was found that only the first solution $(u_1^{(1)})$ is stable; the second solution is unstable for any parameters of the generator. The region of existence of the asymmetric regime is determined. The necessary condition for the absence of repeated saturation is $i_1(0) \geqslant M/2$. This condition is also the sufficient condition in the interval $0.5 < b < 1.5$. The assumptions underlying the analysis give a good approximation to actual processes in most practical cases; hence the proposed method can be considered as general, being applicable to other operating conditions of magnetic pulse-generators and related devices. The obtained formulas are not only qualitatively correct, but they are also in quantitative agreement with experiment; hence they can be used in the design of generators. An illustrative example is given. There are 5 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: W. S. Melville. PIEE Part III, v. 98, no. 53, 1951; K. Busch, A. Hasley, - C. Neitzert. BSTJ. no. 34, 1955.
Card 5/5

ACC NR: AP6029462

AUTHOR: Meyerovich, L. A.; Zaytsev, E. F.; Vatin, I. M.

ORG: None

TITLE: Magnetic current pulse oscillators

SOURCE: Radiotekhnika, v. 21, no. 8, 1966, 49-55

TOPIC TAGS: pulse oscillator, pulse generator, computer application, digital computer, magnetic circuit, frequency stability

ABSTRACT: A new current pulse oscillator design principle used for advance pulse oscillators in digital magnetic computers and as current oscillators in magnetic yokes and possessing substantial advantages over other types is described. These oscillators, in addition to reliability and effective use of power, provide a high degree of pulse amplitude stability under sharply changing load conditions and a short pulse decay time when the load is inductive. Experimental data on two different types of magnetic current pulse oscillators are given. Orig. art. has: 19 formulas and 5 figures.

SUB CODE: 09,20/SUBM DATE: None

Card 1/1   UDC: 621.373

SAFONOV, A., dotsent; BOS'KO, V., assistent; VATIPKO, B.

Estimating the extent of the wear of the hull plating of the ship by ultrasonic testing. Mor. flot 25 no.10:32-34 O '65.
(MIRA 18:11)

1. Zaveduyushchiy kafedroy "Oborudovaniye i tekhnologiya svarochnogo proizvodstva" Nikolayevskogo korablestroitel'nogo instituta imeni admirala S.O. Makarova (for Safonov). 2. Kafedra "Oborudovaniye i tekhnologiya svarochnogo proizvodstva" Niko-layevskogo korablestroitel'nogo instituta imeni admirala S.O. Makarova (for Bos'ko). 3. Glavnyy inzh. Nikolayevskogo cherno-morskogo remontno-mekhanicheskogo zavoda (for Vatipko).

VATIS, V. (Tallin)

Cooperative matters... Zhil.-kom. khoz. 13 no.3:25 Mr '63. (MIRA 16:3)

1. Vneshtatnyy korrespondent zhurnala "Zhilishchno-kommunal'noye khozyaystvo".

(Tallinn—Construction industry)

VATAZHINA, V.I., kand. tekhn. nauk; MUNTS, V.O., kand. arkh.;
PANKRATOV, V.F., inzh.; VOSKOBOYNIKOVA, S.I., inzh.;
GERSHKOVICH, B.M., inzh.; SADAGASHVILI, G.R., inzh.

[Hermetic sealing materials for structural elements]
Germetiziruiushchie materialy dlia stroitel'nykh kon-
struktsii. Moskva, Stroiizdat, 1965. 146 p.
                                        (MIRA 18:7)

VATKIN, In. L.

42331 VATKIN, IA. L. - Fostroyeniye nagruzochnykh diagramm dvigatelya stana k sey prokatki. Nauch. Tr dy (Dnepropetr. metallurg. in-t im. Stalina), VYP. 18, 1948, s. 11.-27.

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948.

VATKIN, Ya. L.

MATVEYEV, Yu.M.; VATKIN, Ya.L.; OSADA, Ya.Ye., kandidat tekhnicheskikh nauk,
retsenzent; MIKHAYLOV, O.A., redaktor; SHCHEDRINA, I.P., tekhniche-
skiy redaktor

[Groove designing of rollers and tools of pipe mills] Kalibrovka
valkov i instrumenta trubnykh stanov. Moskva, Gos. nauchno-tekhn.
izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1951. 412 p.
[Microfilm]   (MLRA 10:7)
            (Pipe, Steel)   (Rolling mills)   (Tubes)

CHEKMAR.V, A.P., akademik; VATKIN, m.1., doctor tekhn. nauk; KHANIN, M.I.,
inzh.

Determining the neutral tangential cross section of the center of
deformation in diagonal rolling. Proizv. trub no.10:24-31 '63.
(MIRA 17:10)

1. AN UkrSSR (for Chekmarev).

VATKIN, Yu.L., dok'or tekhn. nauk; JAROYANSKIY, M.G., inzh.; BEGUNSKIY, L.I., inzh.; WOLTNIK, T..., inzh.; KLOTYUZHENKO, V.I., inzh.; TOLDAYEV, A.D. inzh.

Regulator of the longitudinal wall thickness variation in pipe. Stal'
24 no.9:832-833 S '64.
(MIRA 17:10)

1. Dnepropetrovskiy metallurgicheskiy institut i TSentral'naya laboratoriya avtomatizatsii i mekhanizatsii Pridneprovskogo soveta narodnogo khozyaystva.

VATKIN, Ya.L., doktor tekhn. nauk; CHERNYAVSKIY, A.A., kand. tekhn. nauk; KAZAKOV, V.E., inzh.; GLIKIN, M.P., inzh.; PERCHANIK, V.V., inzh.; KHANIN, M.I., inzh.; BIBA, V.I., inzh.

Reducing internal laps in tube rolling on Pilgrim mills. (MIRA 17:2)
Stal' 24 no.1:63-67 Ja '64.

1. Dnepropetrovskiy metallurgicheskiy institut i zavod im. Libknekhta.

CHEKMAREV, A.P.; VATKIN, Ya.L., dotsent; BERDYANSKIY, M.G., inzhener;
LUDENSKIY, I.A., inzhener; SLESARCHIK, S.D., inzhener.

Reducing longitudinal differences in the walls of pipes made on
automatic mills. Stal' 15 no.1:58-62 Ja '55.   (MLRA 8:5)

1. Deystvitel'nyy chlen Akademii nauk USSR (for Chekmarev).
2. Dnepropetrovskiy metallurgicheskiy institut i Truboprokatnyy
zavod im.Lenina.
          (Pipes, Steel) (Rolling-mill machinery)

S/148/60/000/010/009/018
A161/A030

AUTHOR: Vatkin, Ya.L.

TITLE: Some Peculiarities of the Kinematics of Tube Rolling in Round Passes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, No. 10, pp. 106 - 113

TEXT: The extent of the lead zone in the rolling process with round passes has been determined by mathematical analysys and measurements in the rolling shop on automatic "140" and "400" tube rolling mills at an unidentified plant. It has been stated that the lead zone only occupies a small portion of the deformation focal length, and the value of the conditional lead coefficient is very near the unit. The conclusions meet the data of V.P. Anisiforov (Ref. 2) and A.A. Shevchenko (Ref. 3). In view of the low lead coefficient value it is recommended to ignore it in practical calculations and assume that the rolling diameter of rolls (i.e. the diameter on the output side of the pass at the point where the velocities of the tube and the roll are equal) is equal to the mean rolls diameter D_{cp} (D_{mean}). The mean roll diameter is determined with the equation $D_{mean} = D_1 - \lambda d_K$ (2) where D_1 is ideal roll diameter in mm; d_K -the pass diameter, mm; λ - the condi-

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